UNIDO

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

REGIONAL CONSULTATION ON THE PHOSPHATIC FERTILIZERS AND PESTICIDES INDUSTRIES IN AFRICA

Yamoussoukro, Côte d'Ivoire
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PREFACE

The Second General Conference of the United Nations Industrial Development Organization (UNIDO), held at Lima, Peru, in March 1975, recommended in paragraph 66 of the Lima Declaration and Plan of Action on Industrial Development and Co-operation 1/ that UNIDO should include among its activities a system of continuing consultations between developed and developing countries, with the object of raising the developing countries' share in world industrial output through increased international co-operation. The General Assembly, at its seventh special session in September 1975, endorsed the recommendation and requested UNIDO to implement it under the guidance of the Industrial Development Board.

At its fourteenth session, in May 1980, the Industrial Development Board decided to establish the System of Consultations on a permanent basis. 2/ At its sixteenth session, in May 1982, the Board adopted the rules of procedure, 3/ according to which the System of Consultations was to operate, together with its principles, objectives and characteristics (ID/B/258, annex). Notably:

> The System of Consultations shall be an instrument through which UNIDO is to serve as a forum for developed and developing countries in their contacts and consultations directed towards the industrialization of developing countries;
>
> The System of Consultations would also permit negotiations among interested parties at their request, at the same time as or after consultations;
>
> Participants of each member country should include representatives of Governments, industry, labour, consumer groups and others, as deemed appropriate by each Government;
>
> Each Consultation meeting shall formulate a report, which shall include conclusions and recommendations agreed upon by consensus and also other significant views expressed during the discussions.

Thirty-four consultations have been convened since 1977, covering the following industries and topics: capital goods, agricultural machinery, iron and steel, fertilizers, petrochemicals, pharmaceuticals, leather and leather products, vegetable oils and fats, food-processing, industrial financing, training of industrial manpower, wood and wood products, building materials, fisheries, non-ferrous metals and sugar-cane.

1/ See Report of the Second General Conference of the United Nations Industrial Development Organization (ID/CONF.3/31), chap. IV.

2/ Report of the Industrial Development Board on its fourteenth session (Official Records of the General Assembly, Thirty-fifth Session, Supplement No. 16 (A/35/16)), vol. II, chap. XI, para. 153.

3/ Report of the Industrial Development Board on its sixteenth session (Official Records of the General Assembly, Thirty-seventh Session, Supplement No. 16 (A/37/16)), chap. IV, para. 46.

CONTENTS

	Paragraphs	Page
PREFACE		1
INTRODUCTION	1-7	4
AGREED CONCLUSIONS AND RECOMMENDATIONS	8-14	6
Chapter		
I. ORGANIZATION OF THE REGIONAL CONSULTATION	15-32	11
II. REPORT OF THE PLENARY SESSIONS	33-62	14
III. REPORT OF THE WORKING GROUP ON ISSUE 1: THE NECESSITY OF AN INTEGRATED APPROACH TO FERTILIZER PRODUCTION AND USE IN AFRICA; REPORT OF THE WORKING GROUP ON ISSUE 2: OPPORTUNITIES FOR INTERNATIONAL CO-OPERATION FOR THE DEVELOPMENT OF THE FERTILIZER INDUSTRY IN AFRICA	63-77	19
IV. REPORT OF THE WORKING GROUP ON ISSUE 3: CURRENT SITUATION OF AND PROSPECTS FOR THE PESTICIDES INDUSTRY IN DEVELOPING COUNTRIES WITH SPECIAL EMPHASIS ON AFRICA	78-88	22
Annexes		
I. List of participants		25
II. List of documents		29

INTRODUCTION

1. The Regional Consultation on Phosphatic Fertilizers and Pesticides Industries in Africa was held at Yamoussoukro, Côte d'Ivoire, from 12 to 16 December 1988. The Consultation was attended by 49 participants from 24 countries and six international and other organizations (see annex I).

2. The Regional Consultation was organized by UNIDO and hosted by the Government of Côte d'Ivoire.

Background to the Regional Consultation

3. Four Consultations on the fertilizer industry have been convened so far: at Vienna, Austria, in January 1977; at Innsbruck, Austria, in November 1978; at São Paulo, Brazil, in September/October 1980; and at New Delhi, India, in January 1984.

4. Those Consultation meetings drew conclusions and formulated recommendations, inter alia, with respect to:

(a) Contract procedures and arrangements intended to ensure the successful construction and operation of fertilizer plants;

(b) Ways of reducing the high cost of fertilizer plants including their operational and maintenance requirements;

(c) The continuous monitoring of the global patterns of fertilizer production and consumption to facilitate decision-making on investment, procurement etc. in the fertilizer sector;

(d) The opportunities for co-operation between developing countries at the subregional, regional and interregional levels, and the international support needed for that co-operation;

(e) Strengthening technological capabilities in developing countries in the fertilizer sector;

(f) Exploring technological alternatives, such as mini-fertilizer plants, that were more suitable to the conditions of developing countries.

Global Preparatory Meeting

5. A Global Preparatory Meeting for the First African Regional Consultation on the Phosphatic Fertilizer and Pesticide Industry was held at Lomé, Togo, from 3 to 6 February 1988. The immediate aim of the Global Preparatory Meeting, which was attended by some 60 African and international experts, was to advise the UNIDO Secretariat on the selection of priority issues for consideration at the Regional Consultation.

Priority issues identified by the Global Preparatory Meeting

6. Referring to preparatory documents, papers and discussions, the participants in the Global Preparatory Meeting identified the following subjects as topics of priority that should be brought to the attention of the Regional Consultation:

(a) The formulation of an integrated approach necessary for developing the fertilizer sector in Africa;

(b) The definition of foreseeable ways of international co-operation for promoting the phosphatic fertilizer industry in Africa;

(c) An in-depth analysis of the problems of financing African fertilizer projects and the prospects for the future;

(d) The possibilities for establishing mini-plants for fertilizers in Africa;

(e) The possibilities for setting up an African centre for collecting and disseminating data on the fertilizer sector.

Asian Preparatory Meeting

7. An Asian Preparatory Meeting for the Regional Consultation on the Phosphatic Fertilizers and Pesticides Industries in Africa was held at Lahore, Pakistan, from 17 to 20 October 1988. It focused on assessing Asian technological, engineering, know-how and ancillary capabilities in the phosphatic fertilizer sector from the point of view of their potential contribution to the development of the sector in Africa. The report of the Asian Preparatory Meeting (IPCT.74(SPEC.)), incorporating its conclusions and recommendations, was submitted to the Regional Consultation.

AGREED CONCLUSIONS AND RECOMMENDATIONS

Issue 1: The necessity of an integrated approach to fertilizer production and use in Africa and Issue 2: Opportunities for international co-operation for the development of the fertilizer industry in Africa

Conclusions

8. The Regional Consultation concluded that:

(a) Environmental aspects resulting from soil over-exploitation have reached a critical proportion in many parts of Africa. This, if unattended, will result in a serious loss of agricultural productivity and increased social costs. Adequate fertilizer application is essential to conserve soil productivity;

(b) The integrated approach, which takes into account the entire food production chain and the requirements of balanced rural development, is considered valid by the participants. However, in view of the scarcity of the resources available to many African countries, it might be advisable to establish priorities in the implementation of the concept. This does not, in any way, call in question the need for an integrated approach;

(c) The ultimate incentive for the use of fertilizers (and other agro-chemicals) by the farmer remains his or her assessment of the cost-benefit ratio resulting from the purchase of these inputs. Therefore, agricultural policies designed to promote an increased consumption of fertilizers must pay due attention to this basic consideration. Furthermore, the long-term orientation and persistence of such policies are judged imperative. In this context, it is essential to promote increased food production by encouraging the formation of farmers' associations and the organization of agricultural and rural structures receiving specialized support facilities.

(d) It is agreed that access to reliable and up-to-date information is essential for the efficient management of the fertilizer sector. In many instances, the lack of such information and of the necessary data bases for decision-makers leads to the misallocation of resources;

(e) It is recognized that sufficient information on the economic and technical aspects of fertilizer use is not available to farmers. Proper fertilization requires a balanced supply of all plant nutrients. This includes, first and foremost, the application to the soil-crop systems of an appropriate blend of primary nitrogenous, phosphatic and potassic elements, supplemented by secondary mineral and organic nutrients. It is also essential to pay particular attention to the widest dissemination of know-how and techniques, notably through farmers' associations and international co-operation between these organizations;

(f) There is considerable scope for the manufacture of non-conventional fertilizers that are adaptable to local needs, such as partial acidulation of rock phosphate, bio-organo-mineral degradation of agricultural by-products etc. In this context, the consideration of factors such as energy saving, transportation costs, utilization of agro-industrial residues, biological restitution of soils etc., is of particular relevance;

(g) In addition to the endowment with natural resources, such as phosphate rocks, other conditions related to market potential, technical manpower resources, infrastructure etc., must be met to permit the successful operation of a fertilizer industry;

(h) The availability of funds through innovative project financing remains a prerequisite for the realization of fertilizer projects for both the establishment of new facilities and the rehabilitation of existing capacities;

(i) The urgent need for technical training in all aspects of the fertilizer sector ranging from farm management, research and extension services, industrial back-up services, plant operation and maintenance to marketing and distribution etc., is emphasized.

Recommendations

Recommendations addressed to Governments, industry, international agencies, financial institutions and other relevant bodies

9. The Regional Consultation recommended that:

(a) Since the problems of the fertilizer industry are inextricably linked to the formulation and implementation of overall agricultural policies, Governments should accord high priority to policy provisions conducive to increasing fertilizer production and consumption;

(b) UNIDO and other relevant international organizations should consider the establishment of an international panel of experts comprising a limited number of specialists to undertake the preparation of a manual containing guidelines on the integrated approach to food production, including the optimal role of agro-chemicals;

(c) African countries, when contemplating setting up new manufacturing units, revamping existing facilities or optimizing the utilization of installed capacities, should take into consideration the regional supply/demand situation;

(d) The existing technological options for the use of low-grade and poor quality phosphate deposits, prevalent in many African countries, should be scrutinized and the findings made available to the countries concerned. The potential and limitations of the direct application of ground phosphate rocks as fertilizers to specific soil-crop systems in selected African locations should also be examined;

(e) Viable and appropriate small-scale fertilizer plants, especially in land-locked countries, should be encouraged, in order to optimize the use of locally available resources (both mineral and organic). Furthermore concrete steps should be undertaken towards the realization of this concept in a specific fertilizer project in an African location in a context of international co-operation. The purpose of such an undertaking would be to establish the commercial viability and operational feasibility of these plants as well as their environmental impact;

(f) International and regional financial institutions are invited to strengthen their efforts to raise funds for the development of the fertilizer sector, particularly for the establishment of projects with a regional and subregional impact. In this context, consideration should also be given to

the manufacture of non-conventional fertilizers suitable for Africa. Innovative financing packages that have emerged recently in other industrial sectors and regions could be considered for adaptation;

(g) National efforts for the collection, assessment and dissemination of information pertinent to the fertilizer sector should be supported by international co-operation, and subregional information networks should be set up. In this context the relevant international agencies are called upon to render assistance;

(h) Opportunities for training should be increased at all levels by using the most operational methods, such as computer-assisted techniques, in all areas of the fertilizer industry. Those countries possessing a well-developed fertilizer sector are invited particularly to share their experience through better adapted training programmes for the development of the fertilizer sector in Africa. UNIDO and other relevant international agencies should play an active role in this field;

(i) The potential for enterprise-to-enterprise co-operation, both between companies in the South and between those of African and industrialized countries, in all aspects of the fertilizer sector through co-operation arrangements should be more systematically exploited. UNIDO and other international organizations are encouraged to render assistance to this end;

(j) In the light of the fact that some African countries have already gained considerable experience in their phosphatic fertilizer industries, other countries desirous of developing this sector should be encouraged to co-operate with a view to capitalizing on this know-how.

Issue 3: Current situation of and prospects for the pesticides industry in developing countries

Conclusions and recommendations

Development of and need for the exchange of information

10. The Regional Consultation agreed on the following:

(a) There is a need for the collection and exchange of information between the countries of the African region. This information system should cover areas like registration procedures, sources of supply, trade, usage, technologies available, production and safety aspects. It is recommended that the establishment of an African Regional Network should be considered on the lines of the Fertilizer Advisory, Development and Information Network for Asia and the Pacific (FADINAP) and UNDP/UNIDO Regional Network for the Production, Marketing and Control of Pesticides in Asia and Far East and that there must be a close liaison established with these institutions to draw maximum advantages from their experiences;

(b) UNIDO and other specialized agencies of the United Nations, as well as other international bodies, may be called upon to assist in the preparation of guidelines for the various steps of handling, distribution and advisory services related to pesticide production and quality control based on experience gained at the national and regional levels;

(c) Expert group meetings should be convened by UNIDO to exchange information and experience in various aspects related to the usage and production of pesticides.

Market development

11. It is recognized that in order to develop the use, and hence the manufacture, of pesticides in developing countries, the existing infrastructure of marketing, distribution and extension services needs to be strengthened. It is also recognized that farmers' co-operatives can play an important role in this respect. Policy planners and Governments need to review pricing policies and to introduce subsidies and/or credit facilities for farmers.

Improving utilization of pesticide manufacturing units

12. The Regional Consultation agreed on the following:

(a) The low capacity utilization of existing plants is mainly due to a low consumption level. It is recommended that conducive government policies, better training of farmers and education and promotional schemes should be strengthened. Steps in this direction need to be initiated;

(b) National Governments should ensure that new production facilities are established based on detailed feasibility studies and taking into account emerging new technologies relevant to their needs. In this regard, the assistance of the specialized agencies of the United Nations should be made available;

(c) Subregional co-operation should be energetically pursued to improve the capacity utilization of existing plants and the establishment of new ones;

(d) It is recognized that safety and technical audits could result in a higher productivity of operating pesticide plants. It is recommended that the specialized agencies of the United Nations should assist the requesting countries in this regard.

Training

13. It is felt that there is a strong need for the development of local manpower in the following areas:

Production and quality control
Marketing and distribution
Application and efficient usage
Safety

It is recommended that workshops should be organized to facilitate the training of manpower. Full advantage of the assistance offered by developed countries should be taken. Furthermore, the utilization of experts from developing countries, with similar experiences in the development, production and efficient use of pesticides to promote technical co-operation between developing countries, should be encouraged.

Registration procedures

14. It is concluded that registration procedures are the backbone of the safe and proper use of pesticides. It is recommended that developing countries

should, therefore, introduce adequate registration procedures along the lines of those of FAO and other pioneering organizations engaged in the development of environmental safety norms. It is further recommended that FAO and UNIDO should provide assistance with respect to specific requests from developing countries in this field.

I. ORGANIZATION OF THE REGIONAL CONSULTATION

Opening of the Regional Consultation

Statement on behalf of the Minister and Mayor of Yamoussoukro

15. The First Deputy Mayor of the capital city of Yamoussoukro, in a statement read on behalf of the Minister and Mayor, welcomed the participants to Yamoussoukro. Located as Yamoussoukro was between the forest and the savannah, its choice as a venue for the Regional Consultation underlined the need for the increased use of both fertilizers and pesticides. In this regard, the municipal laboratories had amply demonstrated the efficiency and effectiveness of the appropriate use of those agro-chemicals.

16. Reminding the participants of the proposed technical visits to agricultural processing plants in the vicinity, during which the experience gained in productivity increases by application of fertilizers and pesticides would be described, he wished the Consultation success in its deliberations.

Statement of the Minister of Industry and Planning

17. The Minister of Industry and Planning of Côte d'Ivoire, in opening the Regional Consultation, expressed appreciation to UNIDO on behalf of the President, the Government and the people of Côte d'Ivoire for having chosen Yamoussoukro as the venue for the meeting. After welcoming the participants, he pointed out that fertilizers and pesticides were indispensable products for the development of agriculture, a vital sector to which his country assigned a high priority.

18. The goal of the System of Consultations was to increase the share of the developing countries in world industrial output, and thereby to promote the well-being of their populations through increased international co-operation, including North-South and South-South co-operation. Africa was the youngest continent from the point of view of industrial development, and the current gathering represented a contribution towards enabling it to play its due role in international co-operation.

19. With regard to the first of the three issues before the Regional Consultation, he said that industry occupied a middle position between the primary and tertiary sectors and had to perform by adding value to the products that it received. That position in the middle represented both its strength and its weakness. With regard to issue 2, he stressed the importance of exploring possibilities for international co-operation for the development of the fertilizer industry in Africa. Issue 3 was also a priority concern, and the prospects for the pesticides industry seemed to him to be promising in view of the growing needs of Africa in that area. Africa, however, was faced with grave economic problems, due in part to the low level of effective domestic demand, which was currently depressed by the debt burden, the low prices of indigenous raw materials and the highly competitive export market for agricultural commodities.

20. For all those reasons, his country would be taking a keen interest in the discussions that were about to begin. He wished the participants success in their deliberations and declared the Regional Consultation officially opened.

Statement on behalf of the Director-General of UNIDO

21. The Deputy Director-General, Department of External Relations, Public Information, Language and Documentation Services, in a statement presented on

behalf of the Director-General of UNIDO, said that in its promotion of industrial development, UNIDO had endeavoured to allocate the highest priority to industrial activities that met the fundamental needs of people in developing countries. The solution of the food crisis in Africa needed concerted action to develop the critical inputs for agricultural growth. Fertilizers and pesticides were two of the most important inputs. It had been in full recognition of the priority accorded to the fertilizer industry within UNIDO that it had become the first industrial sector to be covered by the System of Consultations.

22. He recalled the role that Africa played in the global production, consumption, export and import of fertilizers. In 1985/86, Africa consumed 1.5 million tonnes of nitrogenous fertilizers, 0.84 million tonnes of phosphate nutrients and 0.3 million tonnes of potash.

23. Africa nevertheless produced 1.4 million tonnes of nitrogenous, 4 million tonnes of phosphatic and very few potassic fertilizers. While Africa was a net importer of nitrogen and potash fertilizers, it was a net exporter of phosphatic fertilizers and the home of major phosphate rock deposits.

24. He also said that some African countries, including Morocco and Tunisia, were among the world's foremost producers of phosphates and had, accordingly, acquired invaluable experience in the mining, concentration and processing of phosphates.

25. He added further that, with respect to pesticides - the other vital and complementary group of agro-chemicals and a subject of the Regional Consultation - it had been estimated that pre- and post harvest losses of food crops in Africa amounted to a staggering 40 per cent of agricultural production. For fruit and vegetables, the corresponding figure was even higher. Nevertheless, the use, and particularly the manufacture and formulation, of pesticide compounds remained extremely modest on the African continent. The reasons for that were varied and complex: they related mostly to the lack of technological know-how, the limitations of the purchasing power of farmers, foreign exchange restrictions and the prevalence on the continent of outdated agricultural production techniques.

26. He concluded by saying that it was against that background, and in recognition of the benefits to be gained from international co-operation for the promotion of the fertilizer and pesticide industries in Africa, that the Regional Consultation had been convened by UNIDO.

Election of officers

27. The following officers were elected:

Chairman:	Joseph Aka-Anghui (Côte d'Ivoire), President, Union patronale de la Côte d'Ivoire
Vice-Chairmen:	C. K. Gopalakrishnan (India), Commercial Manager, Fact Engineering and Design Organisation Armand Davister (Belgium), Consultant Jean Michel Cherubin (Haiti), Vice-President, AGRI-SUPPLY Co.
Rapporteur:	Salah Abd Alla El Amin (Sudan), Chief Chemist, Ministry of Industry

Adoption of the agenda

28. The Regional Consultation adopted the following agenda:

1. Opening of the Regional Consultation
2. Election of Chairman, Vice-Chairmen and Rapporteur
3. Adoption of the agenda
4. Presentation of the issues by the Secretariat:

   Issue 1: The necessity of an integrated approach to fertilizer production and use in Africa

   Issue 2: Opportunities for international co-operation for the development of the fertilizer industry in Africa

   Issue 3: Current situation of and prospects for the pesticides industry in developing countries with special emphasis on Africa

5. Discussion of the issues
6. Conclusions and recommendations
7. Adoption of the report
8. Closing of the Regional Consultation

Establishment of working groups

29. The Regional Consultation established two working groups to discuss the issues and to propose conclusions and recommendations for consideration at the final plenary.

30. Armand Davister (Belgium) was elected the Chairman of the working group on issues 1 and 2, and C. K. Gopalakrishnan (India) was elected the Chairman of the working group on issue 3.

Documentation

31. The documents issued prior to and distributed at the Consultation are listed in annex II.

Adoption of the report

32. The report of the Regional Consultation on Phosphatic Fertilizers and Pesticides Industries in Africa was adopted by consensus at the final plenary on 16 December 1988.

II. REPORT OF THE PLENARY SESSIONS

Statement by the Director of the System of Consultations Division

33. The Director of the System of Consultations Division pointed out that Consultation meetings provided a unique forum for the discussion of specific sectoral problems and concrete suggestions for their solution. To this end, new types of co-operation between interested parties were explored at Consultations, as well as in the preparatory and follow-up phases.

34. He recalled that the main orientation of the current activities of the System, as determined by the Industrial Development Board, was clearly directed to those industrial sectors providing the inputs needed for increasing agricultural productivity and for mitigating the impact of the crisis in agriculture. He reminded the participants that the issues submitted to the Regional Consultation had been identified as priority topics by the Global Preparatory Meeting and expressed the hope that, in drawing on that preliminary work, the Regional Consultation would formulate sound and realistic recommendations. He concluded by urging the participants to avail themselves of the many opportunities offered, during and after the Consultation, for discussing technical assistance and investment promotion projects.

Presentation of the issues

Issue 1: The necessity of an integrated approach to fertilizer production and use in Africa

35. Issue 1 was introduced by a representative of the UNIDO Secretariat. He said that the many factors contributing to the difficulty of securing growth in African agriculture were not always fully understood in their manifold interactions. Obviously those factors covered a wide range, from government policies and resource endowment to the adequacy of supplies of inputs and the efficiency of the economic environment in which farmers and traders had to operate.

36. It was, however, widely recognized that among all the external inputs to agriculture designed to increase crop productivity, chemical fertilizers figured most prominently. The role of plant nutrients (nitrogen, phosphates and potash), therefore, was indispensable in any strategy to boost agricultural output. The increased use of fertilizer had undoubtedly been one of the main pillars behind the growth of agriculture in some developing countries in recent years.

37. The intention of the paper on issue 1 was to recapitulate systematically, and to focus on, those factors that, taken together, had inhibited a wider and more efficient use of fertilizers in Africa. Suggestions had been made in the paper for removing those obstacles through what must necessarily be an integrated approach consisting of complementary measures to promote the use of agro-chemicals on the African continent. It should be recalled that food production in Africa, however alarming the proportion of its current insufficiency might be, was still capable of a rapid and catastrophic further deterioration if current trends were not arrested and ultimately reversed.

38. The issue paper identified the current obstacles to the use of fertilizers, which could be grouped under the headings of: (a) agricultural pricing policies and subsidies; (b) physical and environmental factors; (c) the efficiency and the effectiveness of fertilizer use; (d) technological and socio-cultural dimensions; and (e) domestic production and related constraints on supply.

Issue 2: Opportunities for international co-operation for the development of the fertilizer industry in Africa

39. A representative of the UNIDO Secretariat, in introducing issue 2, said that the production inputs required by most African countries ranged widely from agro-chemicals, seeds, agricultural implements and machinery, including spare parts, to the adoption of better farm management practices. Without adequate supplies of those inputs, the structural adjustments and agricultural reform programmes, which were widely advocated and often attempted, would remain ineffectual. Although the bulk of modern production inputs would originate outside the continent in the coming years, the large potential to revitalize and expand indigenous input industries in conjunction with the promotion of African intra-regional trade should not be overlooked.

40. In this context, he recalled that some 98 per cent of the world's farmers lived in the developing countries, thus offering a huge and growing market for suppliers of all kinds of agro-inputs. In Africa, some 80 per cent of the population were engaged in the agricultural sector, underlining the predominance of agrarian societies on the continent and making agriculture the crucial axis for economic development.

41. The continuing and rising gap between the inputs needed for African agriculture and their availability locally revealed a wide spectrum of possibilities for international co-operation. While recent famine relief operations had amply demonstrated the spirit of goodwill and concern for the African predicament, the root causes of the food crisis should not be forgotten.

42. He then recapitulated briefly the six chapters of the issue paper dealing with the modalities of possible co-operation directed to: (a) the establishment of fertilizer manufacturing facilities; (b) the improvement of efficiency and the rehabilitation of existing plants; (c) increasing the supply of other agro-inputs; (d) regional trade in fertilizer intermediates and final products; and (e) direct external assistance for the development of the fertilizer sector in Africa.

Issue 3: Current situation of and prospects for the pesticides industry in developing countries with special emphasis on Africa

43. Issue 3 was introduced by a representative of the UNIDO Secretariat, who stated that, since the pesticide sector was being covered for the first time by the System of Consultations, an effort had been made to gain a better understanding of it, particularly with respect to: (a) the production, handling, storage and application of pesticides; (b) pest and pesticides management practices; (c) the selection of materials for pesticides and their formulation; and (d) procurement. In the documentation submitted to the Regional Consultation, the following topics had been highlighted:

(a) The role of pesticides and related plant protection agents in agriculture;

(b) The main factors influencing the consumption of pesticides;

(c) The constraints limiting the development of the pesticide sector in developing countries;

(d) Technologies for the formulation and application of pesticides;

(e) The current supply and demand situation and prospects for the industry world-wide;

(f) The possibilities for increasing the role and share of the developing countries in the pesticide industry;

(g) Safety, health and environmental protection;

(h) Strategies for the development of the pesticide industry.

44. He pointed out that the production of pesticides continued to be concentrated in the industrialized countries, but the share of the developing countries was growing, from 10 per cent in 1975 to 20 per cent in 1986.

45. The pattern of regional demand also revealed the dominant role of the industrialized countries. Those countries had accounted for 70 per cent of the total consumption of pesticides in 1975; in 1985, that percentage had risen to 75 per cent. In terms of specific pesticide consumption (kg/ha agricultural land), industrialized regions fell into the categories of high demand (over 4 kg/ha) or medium demand (3-4 kg/ha), while all developing regions fell into the category of low demand (around 1 kg/ha), except for North Africa, which fell into the category of medium demand.

46. Herbicides represented the largest segment of the total consumption of pesticides, but the share of the developing countries in it remained very low (9 per cent in 1975, 8 per cent in 1985), mainly because it was cheaper to substitute manual labour for herbicides. Insecticides were the most important segment of pesticide consumption in developing countries, representing roughly 50 per cent of total consumption. The share of the developing countries in the global market for insecticides was also about 50 per cent.

47. In view of the serious concerns expressed world-wide about the negative environmental impact of agro-chemicals and the hazards presented by their production, distribution, handling and application and in view, also, of the publicity being given to the so-called biotechnical methods, the studies prepared by UNIDO and submitted to the Regional Consultation had also investigated those phenomena and their possible effects on the future of the pesticide industry.

Summary of discussions

48. The view was expressed that, as far as the main issues relating to the phosphatic fertilizer industry were concerned, emphasis should be placed on proposals for specific programmes to strengthen international co-operation. Regarding the production and use of fertilizers in Africa and the adoption of an integrated approach (which included industrial, agricultural, commercial, financial, logistical and human components), special attention could be paid to five principal areas in order to meet the new challenges:

(a) The promotion of the exchange of information between the main producer countries and specialized enterprises, notably by the development and reinforcement of systems for the collection of data;

(b) The improved integration of industrial units into the national and regional environment, which would involve focusing on all aspects of the fertilizer sector from the extraction of phosphates to the distribution of final products to farmers;

(c) The training of personnel needed for the development of the phosphatic fertilizer industry; in particular for the mastering of technologies, the management of enterprises and for maintenance activities, at all levels of skill;

(d) The adaptation of technologies and research on new processes, particularly to permit economies in terms of external purchases (profitable utilization of phosphatic resources, improved efficiency of fertilizers, modernization of industrial units, mini-plants, improvement of product quality etc.), whereby emphasis would be placed on the dissemination among farmers, by agricultural extension agencies, of technologies adapted to the real conditions of the rural sector;

(e) The recommendation of new types of assistance that could be provided by professionals, particularly from industrialized countries, as part of international co-operation in the years to come, such as technical advice on the implementation of viable projects, and the establishment of joint ventures and licensing agreements with enterprises in industrialized countries.

49. It was also stressed that one of the great challenges in the current world was the development of agriculture and food production in Africa. It was therefore important to endeavour, in a realistic manner, to remove the obstacles inhibiting the use of fertilizers.

50. Among those obstacles, one was the widespread absence of an integrated approach based on an overall view of the agro-food chain. It was impossible to over-emphasize the need to integrate the problem of fertilizers with the general problems of rural development, and the importance, in that regard, of creating agricultural and rural structures that could offer the necessary support to the populations concerned.

51. Efficiency in the use of fertilizers depended on a series of prior conditions, notably the adaptation of the fertilizers to the soil and the crops being grown. A prior analysis of the soil was considered essential.

52. The greatest attention should be paid to the exchange of information and documentation, especially to its dissemination, as well as to training.

53. With regard to the development of the fertilizer industry, it was important, first, to take into account the lessons to be learned from the successes and failures of the various African countries and to adopt a diversified approach based on an evaluation of specific needs; in some cases, that might mean locating the production unit near the place where the product was to be used and favouring units of modest dimensions offering greater flexibility.

54. The fertilizers sold on the world markets had to meet very high quality requirements. In many cases, the use of fertilizers that did not necessarily meet such standards could have the desired effect, and the local production of those types of fertilizer could represent an attractive possibility. As international financing institutions were often reluctant to support such projects, it was suggested that they should review the conditions they imposed in that respect.

55. It was important to start with an overall concept and strategy in establishing and developing a fertilizer industry; in that context, infrastructural considerations would play an eminent role.

56. Finally, with regard to the strengthening of technological capabilities, stress should be laid on the desirability of developing capacities in a series of basic techniques for which there were a wide range of applications in many fields connected with the development of food production and rural areas.

Closing remarks

57. Many participants expressed their gratitude and appreciation to the Government of Côte d'Ivoire for having acted as host to the Regional Consultation on Phosphatic Fertilizers and Pesticides Industries in Africa.

58. Equally, the UNIDO Secretariat was commended for having taken the initiative in convening such an important event for the continent of Africa in two key industrial sectors, whose development was judged instrumental in realizing the aspiration of self-sufficiency in food production. The Regional Consultation had enabled the participants to gain a better understanding of the problems affecting the phosphatic fertilizer and pesticide industries in Africa. Those insights would make it possible for those responsible to make their decisions in a wider context and particularly one of regional and subregional co-operation. The quality of recommendations and conclusions reached at the Regional Consultation was the best testimony to the success of the meeting, which had been conducted in a professional, business-like and co-operative manner.

59. At the closing session, statements were also made by the Chairman of the Regional Consultation and on behalf of the Minister of Industry and Planning. The Minister and Mayor of Yamoussoukro and the Director of the System of Consultations Division also addressed the closing session.

60. The statements emphasized the crucial relevance and usefulness of convening regional Consultations in key industrial sectors. Participants were reminded of the continuous and long-term process of the System of Consultation, whose impetus for follow-up activities was provided by the formulation of conclusions and recommendations. UNIDO would endeavour its utmost, within its limited resources, to implement those measures reflected in the recommendations directed to it.

61. The statements also praised the spirit of goodwill and co-operation that had characterized the deliberations of the Regional Consultation. It was noted with particular satisfaction that all the participants had advocated the notion of international, and particularly regional, co-operation for overcoming the obstacles identified in the discussions of the working groups. That demonstration of the willingness of all concerned to contribute to possible solutions to the problems affecting the two vital sectors of fertilizers and pesticides in Africa was particularly gratifying and boded well for the follow-up activities.

62. Finally, it was stated that it was precisely through channels like the System of Consultations that industrial policies gained in realism, transparency and, therefore, effectiveness, which, in the final analysis, benefited both the developing and industrialized countries through international co-operation.

III. REPORT OF THE WORKING GROUP ON ISSUE 1: THE NECESSITY OF AN INTEGRATED APPROACH TO FERTILIZER PRODUCTION AND USE IN AFRICA; REPORT OF THE WORKING GROUP ON ISSUE 2: OPPORTUNITIES FOR INTERNATIONAL CO-OPERATION FOR THE DEVELOPMENT OF THE FERTILIZER INDUSTRY IN AFRICA

Summary of discussion

63. The Chairman of the Working Group recapitulated the main highlights of the presentation by the Secretariat of the contents of the paper on issue 1 (ID/WG.475/6(SPEC.)) that had been submitted for the consideration of the Regional Consultation. He invited the participants to address themselves particularly to the following matters:

(a) The obstacles and impediments to the use of fertilizers on the African continent;

(b) The strategies and measures capable of increasing the use of fertilizers;

(c) The difficulties of formulating and implementing agricultural policies;

(d) The possibilities for improving the supply of inputs for agriculture.

64. With respect to issue 2, namely, opportunities for international co-operation for the development of the fertilizer industry in Africa, the Chairman invited the participants to comment on the following subjects as set out in the corresponding issue paper (ID/WG.475/7(SPEC.)):

(a) Co-operation for the establishment of fertilizer manufacturing facilities including blending, small-scale and primary transformation units;

(b) External assistance to improve the quality of agricultural extension systems;

(c) Co-operation for the promotion of regional trade in fertilizer intermediates and final products;

(d) The formulation of technical specifications and uniform standards for the machinery and equipment used in fertilizer projects;

(e) Strengthening the abilities of African decision-makers in negotiating contracts for the transfer of technology.

65. Many participants, after expressing their appreciation for the quality of the documentation submitted by the UNIDO Secretariat, described their experiences in the establishment and operation of national fertilizer industries. It was agreed that a natural endowment of raw materials, such as phosphate deposits or natural gas, was not in itself sufficient for the establishment of a fertilizer industry and that other factors, such as market potential, technical manpower resources, infrastructure and technological options, also played a crucial role in its successful operation.

66. Many participants felt that an essential factor for the efficient utilization of existing capacities and the creation of fertilizer plants in Africa in future was subregional co-operation based on the complementarities of the needs and resources of the subregion concerned.

67. Some participants pointed out that the potential for subregional co-operation had remained basically untapped, in spite of the many attempts to that effect and the political goodwill often expressed by those responsible. The representative of the African Development Bank stated that the policy of the Bank regarding industrial financing clearly favoured giving consideration to fertilizer projects with a regional or subregional impact in Africa.

68. Participants also expressed their views on the concept of small-scale fertilizer plants. It was acknowledged that, under ideal conditions, the cost of production per unit of output at the factory gate of large fertilizer plants was more economical in view of the economies of scale and other technological characteristics of those plants. However, fertilizers produced by small-scale plants in developing countries would, in many instances, be more than competitive as regards cost per unit of output when delivered to the farmer. The advantages of smaller manufacturing units were cited as: (a) proximity to the end-users of products; (b) utilization of isolated pockets of raw materials; (c) more manageable requirements for skilled manpower and financial resources; and (d) better responsiveness to the agronomics of a particular subregion.

69. As for the integrated approach described in the paper on issue 1, many participants concurred that it represented a comprehensive and valid concept for increasing the production and use of fertilizers on the continent. Some participants, however, felt that in view of the scarce resources and inability of many countries in Africa to implement the necessary actions on all fronts of the integrated approach simultaneously, it would be more realistic, without invalidating the overall concept, to adopt a selective approach and identify priorities for the allocation of resources.

70. One participant said that the elaboration and implementation of risk-avoidance schemes for farmers using fertilizers represented an effective means of increasing fertilizer consumption, particularly for food crops. The reluctance of many farmers to use fertilizers more widely could be explained by their perception of the risks involved. Those ranged from uncertainties regarding prices for both fertilizers and the farmers' agricultural output, the responsiveness of soil-crop systems to fertilizers, and the cost-benefit ratios of using complementary inputs etc. By shielding farmers from unprotected exposure to such real and perceived risks, their motivation for applying more fertilizers and pesticides would be greatly enhanced.

71. Many participants underlined the need for adequately trained human resources in the fertilizer industry in general and the phosphatic fertilizer industries in particular. Among the many causes responsible for the widespread under-utilization of existing capacities in Africa, undoubtedly inadequacies in technical manpower would figure prominently. The participants agreed that training provided many opportunities for international co-operation both between industrialized countries and developing countries and also between the developing countries themselves.

72. After describing their training facilities, the participants from industrialized countries expressed their willingness to increase the access to them for the training of the manpower needed in African fertilizer industries. Similar offers of co-operation were made by participants from Asian countries.

73. Many participants stressed the need for the creation of comprehensive information networks and data banks encompassing all aspects of the fertilizer industry, but particularly market intelligence for Africa. Some participants considered, however, that the real problem was one of disseminating the right

kind of information to the right kind of people in the industry at the right time. They explained further that often the information was available somewhere but it remained inaccessible to those most in need of it. A representative of the African office of the International Fertilizer Development Centre (IFDC) then described the activities of IFDC in data collection and information dissemination.

74. One participant said that the experience of his country regarding the employment of an integrated approach to the development of agriculture could be of some use to other developing countries. This approach included: the development of irrigated agriculture, which at present constituted 70 per cent of the total cultivated area; extension services that were available throughout the entire country and that provided a wide variety of services to producers of all types of crops; the mechanization of agricultural production; the development and use of new and more productive seeds and plant varieties; the provision of adequate credits to farmers by both government agencies and fertilizer producers; and appropriate policy support at all levels. As a result, his country had been able to achieve considerable success in agriculture; for example, although the population of his country had increased threefold in the 40 years since independence, it had achieved self-sufficiency in food supplies and was able to export considerable quantities of certain crops. The use of fertilizer had also increased during that 40-year period from almost zero to over 1.5 million tonnes of nutrients yearly. In the case of one cash crop, cotton, owing to the balanced use of the correct type of pesticide and fertilizer, production from the same acreage had increased in five years from 2.6 million bales to more than 8 million bales. The adoption of a strict water management régime had helped to double the off-take of water per acre within 20 years.

75. The important conclusion to be derived from that success story was the need not only to adopt an integrated approach, but also to employ a consistent policy for a long time, where selective priority areas could be tackled in various stages in accordance with the availability of resources.

76. Two special problems that related to African conditions and impeded the use of fertilizer were mentioned: one was the migration of farmers from one cultivated area to another and the widespread losses in soil fertility, and the other was the extremely small size of farms and their scattered distribution. Unless correct policies were adopted, particularly with regard to price support and extension services, the loss of valuable land would continue, as well as a low level of land productivity.

77. Finally, some participants drew the attention of the Working Group to the large scope existing in Africa for the manufacture of non-conventional fertilizers that were adaptable to local needs. The partial acidulation of rock phosphates, and the bio-organo-mineral degradation of agricultural and industrial by-products were identified as offering the greatest potential.

IV. REPORT OF THE WORKING GROUP ON ISSUE 3: CURRENT SITUATION OF AND PROSPECTS FOR THE PESTICIDES INDUSTRY IN DEVELOPING COUNTRIES WITH SPECIAL EMPHASIS ON AFRICA

Summary of discussion

78. The Secretariat, in opening the formal discussion on issue 3, stated that fertilizers and pesticides were complementary, the former increased crop yields and the latter safeguarded those yields. The salient points of the paper on issue 3 (ID/WG.475/8(SPEC.)) were recapitulated and the Chairman of the Working Group invited the participants to consider them and to advise the Regional Consultation on the conclusions that could be drawn and recommendations that could be made.

79. Several participants representing developing countries made statements on national experiences in pesticide usage and production. The need for pesticides was stressed since they played an important role in the growth of agricultural productivity in Africa. Many participants pointed out that some of the major impediments to the increased application and use of pesticides, in addition to those traditionally faced in industrial development were: the lack of purchasing power due to current general economic conditions within the African countries; the decline, already noted, in government support, which previously had been behind the initial growth of pesticides; the possible lack of know-how on the part of farmers; the paucity of agricultural extension services, particularly for small farmers; amd the lack of advisory services on the type and dosage of products to be applied to target areas at certain periods. It was observed that local formulation plants helped to ease hard currency problems but, equally, in some cases, grants in kind, in the form of pesticides products that had been formulated abroad, were judged by some participants to be detrimental to the viability of local industries. Without questioning the principle of such donations in kind, some participants expressed the view that the donating agencies and countries should also look into the possibilities of local formulation. Many participants underlined the role of the specialized agencies of the United Nations in the promotion of the pesticide sector and stressed the need for international co-operation.

80. Several participants highlighted the importance of collecting and exchanging information. It was observed that, while information on composition, physical and chemical properties, health, safety and environmental effects, as well as methods of application, was easily available from several sources, reliable data on production, consumption, trade, the economics of production, appropriate use of fertilizers and technology were harder to obtain. Some participants observed that it would be possible to pool the resources within a region if each country made efforts to create an information system that would pave the way for regional integration and interregional co-operation for the better utilization of pesticides to increase crop yields. It was suggested that, for each subregion of Africa, one representative country might be selected to channel information to a centre where a computerized data bank could possibly be established. For example, Côte d'Ivoire and Kenya could act as subregional focal points for West Africa and East Africa, respectively. Many participants recognized that registration procedures covering the import of pesticides, their formulation and usage were regulated in some countries by the authorities concerned. Several procedures were available as guidelines, for countries who still had none, including guidelines issued by specialized agencies of the United Nations. Some participants stressed the need for regional co-ordination and the development of standardized registration systems, which would require inputs from reliable institutions in individual countries. The assistance of international organizations in achieving those objectives was thought to be necessary.

81. The representative of Denmark made available a copy of the Danish registration procedure for pesticides. He expressed the readiness of his Government to provide assistance, if requested, in the abatement of pollution from pesticides.

82. Some participants emphasized the importance of the treatment and disposal of hazardous wastes. An African participant described the efforts of his country to initiate an in-depth investigation for the acquisition and installation of an incinerator for the disposal of hazardous wastes. He invited international agencies to help in the implementation of that important industrial project, which would also have a regional impact. It was stressed that, unlike other chemicals, pesticides required special attention because of their toxic nature.

83. The representative of the World Health Organization stressed the necessity of considering the environmental impact of using pesticides.

84. Some participants observed that the establishment of pesticide formulation plants had made a positive contribution to the industrialization of their countries and had also promoted the use of pesticides. Capacity utilization in many countries, however, was below the usual level. Some participants opined that subregional co-operation between African countries could alleviate that problem. It was also noted that the technologies were continuously changing and there was a need for upgrading them to produce safer and more economic and efficient pesticide formulations.

85. Some participants stressed the economic effectiveness of using pesticides underlining the necessity of extending their application in developing countries. It was pointed out that an inadequate market might be responsible for low capacity utilization, a scenario that might nevertheless be changed partially by the introduction of improved formulation technologies.

86. Some participants underlined the necessity of establishing new projects only after a thorough and realistic market analysis of the individual country, as well as the region, had been conducted. Some participants said that UNIDO should develop a standard model project for the formulation and packaging of pesticides. The project should elaborate the process technologies for different formulations and include information relating to:

(a) Formulation know-how and its suitability to domestic conditions;

(b) Process flow-sheet;

(c) Material and energy balances;

(d) Utilities;

(e) Equipment;

(f) Human resources;

(g) Information on engineering consultancy services and vendors of technology;

(h) Investment and operation of the plant;

(i) Budgetary estimates of costs.

87. One participant referred to the need to offer new technologies to developing countries at reasonable prices. Another participant highlighted the high costs incurred by developed countries in developing new products.

88. Several participants stressed the need for assistance from specialized agencies of the United Nations in obtaining training in the use and handling of raw materials, plant operation and maintenance, quality control, and the efficient use of pesticides.

Annex I

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Annex II

LIST OF DOCUMENTS

Issue papers

Issue 1:	The necessity of an integrated approach to fertilizer production and use in Africa	ID/WG.475/6(SPEC.)
Issue 2:	Opportunities for international co-operation for the development of the fertilizer industry in Africa	ID/WG.475/7(SPEC.)
Issue 3:	Current situation of and prospects for the pesticides industry in developing countries with special emphasis on Africa	ID/WG.475/8(SPEC.)

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Survey and guidelines on joint venture agreements among developing countries in the fertilizer industry	ID/WG.475/2(SPEC.)
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